

REMARKS

Applicant respectfully requests reconsideration of this application. Claims 1-87 are pending in the application. Applicant thanks the examiner for indicating that claims 6, 7, 38, 39, 56, 57, 71, 72, 78, 79, 84, 85 have been allowed.

The Examiner rejected claim 1 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,644,662 of Vuylsteke (hereinafter “Vuylsteke”). Applicant respectfully disagrees with the rejection because Vuylsteke does not disclose each and every element of the invention as claimed in claim 1.

The Examiner argued Vuylsteke discloses “a method [for] performing multi-scale unsharp masking on the input data using different scale dependent parameter for different scales selected based on the source of input data (Fig. 4;  $b_0$ - $b_{L-1}$  and  $g_L$  are the multi-scale unsharp values. Scale dependent parameters are met by  $g_1$ - $g_{L-1}$ ” (Office Action, page 4, paragraph 3).

The Applicant respectfully disagrees with the Examiner. Vuylsteke discloses image decimation into lower resolution images and a method for reconstructing the image after the image has been decomposed into a lower resolutions (Vuylsteke, Column 6, lines 30- 52 and Column 7, lines 13-16). Furthermore, Vuylsteke describes the use of filter coefficients based on samples of a two dimensional Gaussian distribution on a 5x5 grid where “the same filter coefficients are used for the low pass filters 20, 20', 20'', 2''' at all scales” (Vuylsteke, column 6, line 64 to column 7, line 5).

The Applicant respectfully submits that Vuylsteke does not disclose “performing multi-scale unsharp masking on the input data using different scale dependent parameters for different scales selected based on the source of input data,” as claimed by the Applicant in claim 1.

According to claim 1, input data is subject to multi-scale unsharp masking using different scale dependent parameters for different scales which are based on the source of the input data.

However, Vuylsteke describes modifying image data at different decomposition levels with a filter. The filter, however, is computed based on a gaussian distribution and the filter is used at every level of decomposition (Vuylsteke, column 6, line 64 to column 7, line 5). As such, the filter fails to be scale dependent, as claimed by the applicant in claim 1.

Furthermore, the scaling coefficients, or filters as described by Vuylsteke, are based on a gaussian distribution over a 5x5 grid. That is, the coefficients are based on a normal distribution, which is also known as a bell shaped curve. However, since the filter is based on a normal distribution, the coefficients are not based on the source of input data, as claimed by the applicants in claim 1.

Thus, Applicant respectfully submits that Vuylsteke does not disclose each and every element as claimed by the Applicant in Claim 1 and is not anticipated by Vuylsteke under 35 U.S.C. § 102(b). Therefore, Applicant respectfully requests withdrawal of the rejection of Claim 1 for at least the reasons discussed above.

The examiner further rejected claims 2-5, 10, 13, 16-20, 27-37, 47-55, 60, 66-70, and 75-77 under 35 U.S.C. § 102(b) as being anticipated by *Multiscale Contrast Enhancement of Medical Images* of Boccignone et al. (hereinafter “Boccignone”). Applicant respectfully disagrees with the rejection because Boccignone does not disclose each and every element of the invention as claimed by the Applicant.

With respect to claim 2, the Examiner argued Boccignone discloses “a method [for] modifying coefficients in at least two of the plurality of decomposition levels, to sharpen or

smooth the coefficients in the at least two decomposition levels using different scale dependent parameters for each of the decomposition levels [because]  $\psi(x, y)$  is scale dependent as it can be seen from  $2^{-2j}$  factor, where  $j$  is scale dependent.  $\phi(x, y)$  is used to smooth” (Office Action, page 5, paragraph 4). The applicant respectfully disagrees with the rejection because Boccignone fails to disclose each and every element of the invention as claimed by the Applicant in claim 2.

Boccignone discloses an equation that “produces a sequence of gradients of  $I(x, y)$  smoothed by  $\phi(x, y)$ , at dyadic scales” (Boccignone, page, 2790, column 1, lines 1-3). The equation contains a wavelet transform to obtain wavelet coefficients at certain scale levels, smoothed by a smoothing function:

$$\psi_{2^j}^k = 2^{-2j} \psi^k(2^{-j}x, 2^{-j}y)$$

The Examiner argued that this function discloses “modifying coefficients in at least two of the plurality of decomposition levels, to sharpen or smooth the coefficients, by scaling coefficients in the at least two decomposition levels using different scale dependent parameters for each of the decomposition levels” (Office Action, page 5, paragraph 4). The Applicant respectfully submits, however, that the wavelet transform,  $2^{-2j} \psi^k(2^{-j}x, 2^{-j}y)$ , is simply a dilation of the wavelet equation,  $\psi_{2^j}^k$ , to scale  $2^j$ . More particularly,  $2^{-2j} \psi^k(2^{-j}x, 2^{-j}y)$  is a magnification of  $\psi_{2^j}^k$  at scale  $2^j$ . Thus, the smoothing equation applied in the dilation equation simply obtains the wavelet coefficients at a dyadic scale  $2^j$ . However, obtaining smoothed coefficients at a dyadic scale level, does not describe “modifying coefficients in at least two of the plurality of decomposition levels, to sharpen or smooth the coefficients, by scaling coefficients in the at least

two decomposition levels using different scale dependent parameters for each of the decomposition levels” because the smoothing equation  $\phi(x, y)$  is not revealed as being scale dependent or smoothing based on a scale dependent parameter. Therefore, the modification of coefficients at different decomposition levels is not achieved with scale dependent parameters, as claimed by the applicants in claim 2. Applicant respectfully requests withdrawal of the rejection.

Furthermore, independent claims 35, 49, 50, 53, 69, and 75 contain features and limitations similar to those in independent claim 2. Thus, for at least the same reasons discussed above, claims 35, 49, 50, 53, 69, and 75, are also not anticipated by Boccignone. Since dependent claims 4, 5, 10, 13, 16-20, 27-34, 36, 37, 47, 48, 51, 54, 55, 60, 66-68, 70, 76, 77, depend from, directly or indirectly, independent claims 2, 35, 49, 50, 53, 69, and 75, the claims 4, 5, 10, 13, 16-20, 27-34, 36, 37, 47, 48, 51, 54, 55, 60, 66-68, 70, 76, 77 are also not anticipated by Boccignone for at least the same reasons. Applicant respectfully requests withdrawal of the rejections.

Accordingly Applicant respectfully submits that the rejection under 35 U.S.C. § 102(b) has been overcome by the amendments and the remarks. Applicant submits that claims 2-5, 10, 13, 16-20, 27-37, 47-55, 60, 66-70, 75-77 are now in condition for allowance and such action is earnestly solicited.

The examiner further rejected claims 8-9, 40-41, 58-59, 73-74, 80-81 under 35 U.S.C. § 103(a) as being unpatentable over Boccignone in view U.S. Patent No. 5,774,578 of Shimizu (hereinafter “Shimizu”).

As discussed above, Boccignone fails to disclose each and every element of the invention as claimed by the Applicants with respect to the independent claims from which dependent

claims 8-9, 40-41, 58-59, 73-74, 80-81 depend. Furthermore, Shimizu describes the use of density histograms in image processing, but fails to address image processing using multi-scale wavelet decomposition. Thus Shimizu also fails to describe or disclose those elements that Boccignone failed to describe or disclose with respect to the independent claims. Thus, taken alone or in combination, Shimizu and Boccignone fail to describe or suggest every element as claimed by the applicants in the noted independent claims. Since dependent claims 8-9, 40-41, 58-59, 73-74, 80-81, contain features that further describe or limit the noted independent claims, then Shimizu and Boccignone also fail to describe or suggest every element as claimed by the applicants in claims 8-9, 40-41, 58-59, 73-74, 80-81.

Accordingly, Applicant respectfully submits that the rejection under 35 U.S.C. § 103(a) has been overcome by the remarks. Applicants submit that claims 8-9, 40-41, 58-59, 73-74, 80-81 are now in condition for allowance and such action is earnestly solicited.

The Examiner rejected claims 11-13, 14, and 15 under 35 U.S.C. § 103(a) as being unpatentable over Boccignone in view of Vetterli et al. (NPL document).

As discussed above, Boccignone fails to disclose each and every element of the invention as claimed by the Applicants with respect to the independent claims from which dependent claims 11-13, 14, and 15 depend. Vetterli describes filter banks and discrete time bases for different types of wavelet transforms (Vetterli, chapter 3). However, Vetterli also fails to describe or disclose every element with respect to the noted independent claims. Since Boccignone and Vetterli fail to describe or suggest each and every element as claimed by the applicants in the noted independent claims, and claims 11-13, 14, and 15 depend from the noted independent claims while adding features that further limit the independent claims, then claims

11-13, 14, and 15 are also not rendered obvious by Boccignone in view of Vetterli. Applicant respectfully requests withdrawal of the rejections.

Accordingly, Applicant respectfully submits that the rejection under 35 U.S.C. §103(a) has been overcome by the remarks. Applicants submit that claims 11-13, 14, and 15 as amended are now in condition for allowance and such action is earnestly solicited.

The examiner rejected claims 21-26, 42-46, and 61-65 under 35 U.S.C. § 103(a) as being unpatentable over Boccignone in view of Choi et al. (NPL document).

As discussed above, Boccignone fails to disclose each and every element of the invention as claimed by the Applicants with respect to the independent claims from which dependent claims 21-26, 42-46, and 61-65 depend. Furthermore, because Choi merely discusses the application of Besov projections to provide denoising to wavelet coefficients, Choi also fails to disclose the elements of the invention with respect to the independent claims. Because neither Boccignone or Choi, alone or together describes each and every element as claimed in the noted independent claims, and dependent claims 21-26, 42-46, and 61-65 contain features and limitations that further limit the noted independent claims, then Boccignone and Choi fail to describe or suggest each and every limitation as claimed by the Applicant in claims 21-26, 42-46, and 61-65. Applicant respectfully requests withdrawal of the rejection.

Accordingly, Applicant respectfully submits that the rejection under 35 U.S.C. § 103(a) has been overcome by the remarks. Applicant submits that claims 21-26, 42-46, and 61-65 are now in condition for allowance and such action is earnestly solicited.

The Examiner rejected claims 82-83 and 86-87 for reasons similar to those discussed with respect to claims 2, 5, 8, 9, and 20 and further arguing “it is well known that copiers have


image source and classifier unit coupled to the image source, official notice.” However, the Applicant submits that claims 2, 5, 8, 9, and 20 are now in condition for allowance for the reasons discussed above. Thus, for at least the same reasons, claims 82-83 and 86-87 are also in condition for allowance and such action is earnestly solicited.

If there are any additional charges, please charge Deposit Account No. 02-2666 for any fee deficiency that may be due.

Respectfully submitted,

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